Two new species in the genus *Eumerus* Meigen (Diptera: Syrphidae) from Inner Mongolia, China

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Abstract: This paper describes two new species in the genus *Eumerus* Meigen, 1822 (Diptera: Syrphidae) from Alashan Right Banner of China. *Eumerus alxaensis* Huo & Liu **sp. nov.** is similar to *E. tuberculatus* Rondani, but differs from the latter by mesonotum without whitish pollinose middle stripes, tergite 4 with distinctly L-shaped whitish pollinose bands, eyes with long and dense hairs in male but shorter in female, hypandrium ventrally with a semicircular sheet protruding on the middle of lateral margins. *Eumerus seximaculatum* Huo & Liu **sp. nov.** is allied to *E. strigatus* (Fallén), but differs from the latter by eyes bare, vertex covered with pale yellow hairs, whitish pollinose bands on broader tergites, sternite 4 of male with deeply concave posterior margin and male terminalia distinctly different.

Key words: Eristalinae; Eumerini; hover flies; taxonomy

中国内蒙古平颜蚜蝇属二新种记述（双翅目：蚜蝇科）

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摘要：本文记述采自内蒙古自治区阿拉善右旗的平颜蚜蝇属 2 新种，即阿拉善平颜蚜蝇：*Eumerus alxaensis* Huo & Liu **sp. nov.** 和六斑平颜蚜蝇：*Eumerus seximaculatum* Huo & Liu **sp. nov.**。前者近似疣腿平颜蚜蝇 *E. tuberculatus* Rondani，但新种中胸背板缺白色粉被中条纹，第 4 背板白斑呈“L”型，雄性复眼被毛长而密，雌性复眼被毛短，雄性第九腹板腹面两侧中央具半圆形叶状突起；后者近似洋葱平颜蚜蝇 *E. strigatus* (Fallén)，但新种复眼裸，头顶被毛浅黄色，腹部背板上的斑较宽，雄性第 4 腹板后缘凹入深，雄性尾器明显不同。

关键词：管蚜蝇亚科；平颜蚜蝇族；食蚜蝇；分类

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Introduction

The genus *Eumerus* was established by Meigen in 1822 with the type species *Syrphus tricolor* Fabricius, 1798. It is one of the largest syrphid genera in the world with nearly two hundred and eighty species from across all zoogeographic regions (Knutson *et al*. 1975; Thompson *et al*. 1976; Smith & Vockeroth 1980; Violovitsh 1983; Vockeroth & Thompson 1987; Peck 1988; Thompson & Vockeroth 1989; Thompson & Rotheray 1998; Ler 1999; Huo *et al.* 2007; Huang & Cheng 2012; Miranda *et al.* 2013). This genus is relatively poorly studied in Inner Mongolia. Only 5 species have been recorded from this area, with about twenty six species recorded from China (Wiedemann 1830; Sack 1933, 1941; Shiraki 1930; Stackelberg 1952; Huo *et al.* 2007; Huang *et al.* 1996; Huang & Cheng 2012). During our field study on the pests of Cistanche in Inner Mongolia, two new species were recognized. In this paper, these new species are described and illustrated. The type specimens are deposited in the Institute of Grassland Research of CAAS.

Material and methods

This study is based on specimens deposited in the Institute of Grassland Research of CAAS. The male genitalia were extracted using an insect pin with a hooked tip. Genitalia were cleared by boiling in water with diluted KOH pellets for 5 min.

For morphology, terminology follows McAlpine (1981) as specifically applied to Syrphidae by Thompson (1999).

Taxonomy

1. ***Eumerus alxaensis* Huo & Liu sp. nov.** (Figs 1–15)

Male. Head nearly hemispherical, broader than thorax. Compound eyes covered with yellowish white long and dense hairs, narrowly dichoptic, with space between eyes about equal to diameters of two facets. Occiput relatively broad, laterally narrowed downward, black, decorated with yellowish white hairs, along posterior margins of eyes with whitish pollinosity. Vertex black, with metallic luster and yellowish white long hairs. Ocellus triangle isosceles, located on the middle of vertex. Frons shining black, with whitish yellow hairs. Lunule narrow, shining black. Face shiny black, with yellowish long hairs, relatively flat and slightly retracted in lateral view, and expanded gradually downwards on sides in anterior view. Genae narrow, with yellowish white long hairs. Antennal sockets confluent. Antenna large, dark brown, yellowish-brown on apical pedicel and basal scape, scape very short, obviously shorter than pedicel, basal two segments with yellow setae dorsally, nearly quadrilateral, higher than long, with anterior margin obliquely down, combined with dorsal margin obtuse, ventral margin acute. Arista of three segments located near the middle of scape dorsally, thick basally, bare, black.

Thorax. Mesonotum longer than broad, shiny black, decorated with fine punctations and yellowish long hairs, the base with whitish pollinose median spots, not extending into stripes, a row of black short bristles on lateral margins above the base of wings. Scutellum shiny black, broader than long, marginated, with fine punctations and yellowish long hairs, subscutellar fringe absent. Pleuron black, tinged with metallic luster, covered with yellowish hairs, bare on anterior anepisternum ventrally, the middle and posterior part of anepimeron and katepimeron, upper and lower posterior hair patches of katepisternum broadly separated. Metasternum black, with yellow hairs.

Leg. Femur slightly thickened basally. Front leg black, dark brown to tawny on the basal half of tibia and the apical area of femur, covered with yellowish white hairs. Mid leg approximate to front leg; hind femur with tubercles on basal venter, the anterior portion with a ridge decorated with 6–7 black bristles and posterior portion with 4–5 black bristles; tibia slender, with median carinate ventrally on basal half, thickened on apical half. Hind leg black, dark brown to brownish yellow on apical margin of femur and 1/2 of tibia basally. Hairs on hind leg buff, with femur finely punctuate, glossy ventrally. Hind tarsi with black hairs dorsally and black bristles laterally.

Wing. Nearly bare, extremely sparse microtrichia only on marginate portion. Vein r-m oblique, combined with vein M_{1+2} at middle of cell dm posteriorly. Vein R_{4+5} slightly dipping into r_{4+5} cell. Vein M_1 bulged outwards rounded on near apical end and then recurrent apically, crossed with vein R_{4+5} in obtuse angle. The apex of vein dm-cu far from wing margin. Stigma pale yellow. Calypters yellowish-white, halteres tawny.

Abdomen. Longer than head and thorax together, basal part approximately equal to width of thorax, slightly narrowed afterwards laterally; tergites black, with tiny punctations and metallic luster, tergite 2 with inconspicuous brown markings on flanks posteriorly, tergites 3 and 4 black-brown to dark brown on posterior half. Tergites with white hairs except posterior margin on middle of tergites 2 and 3 intermixed with black; tergites 2 and 3 with a pair of nearly transverse white pollinose fasciae, with inner end approaching anterior margin more than outer ends; tergite 4 with L-shaped whitish pollinose markings. Sternites black to dark brown, with pale hairs. Posterior margin of sternite 4 concaved shallowly and triangularly. Male genitalia shiny black with white hairs.

Male terminalia. Black to black-brown. Epandrium rectangular in lateral view. Cerci quadrate, with light long hairs on outer surface. Surstylus irregularly lobed in appearance, with light hairs on surface; triangular on lower half of interior bent towards the midline and close to cerci, surface dense with brown setae. Hypandrium yellow, inflated basally, apical half diminished obviously, semicircular plate protruded on ventral margin near middle both lateral. Superior lobe rectangular in lateral view, with black sheet structure on superior lobe apically. Aedeagus an acute cone.

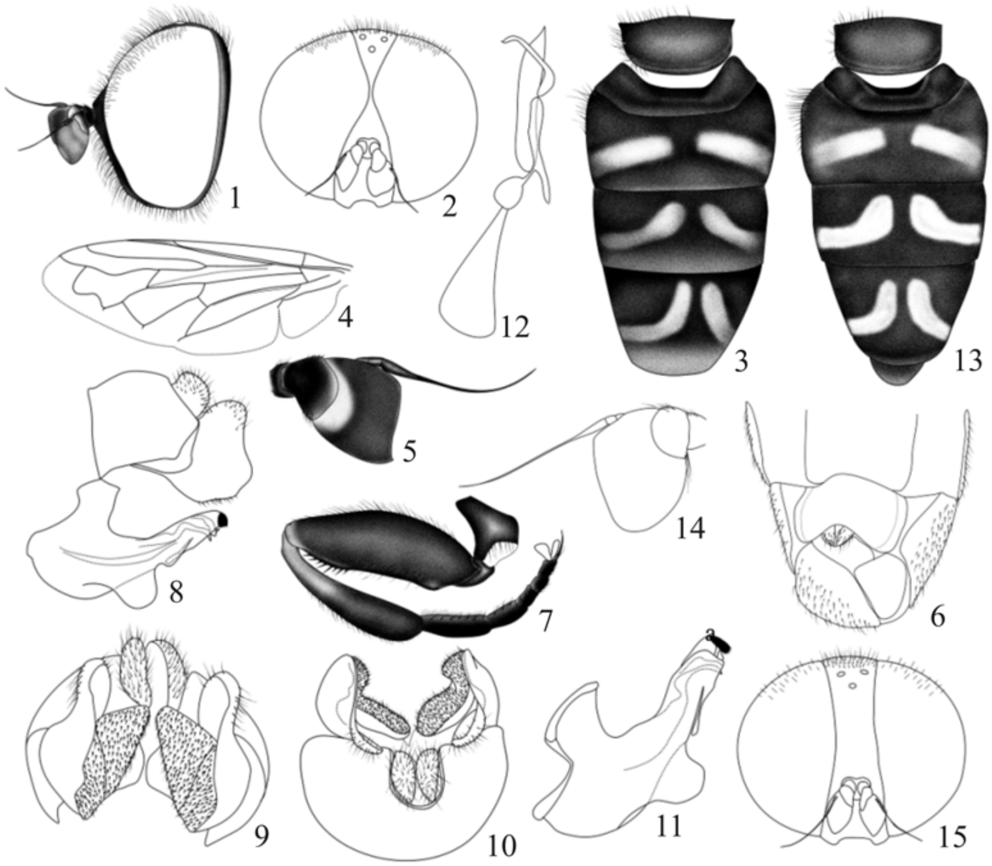
Female. Eyes covered with short and sparse hairs. Vertex on posterior margin of eyes broader, occupying about 1/6 of the head width, vertex and frons almost parallel laterally. Antennae broader than in the male. Posterior margin of sternite 4 straight.

Body length, ♂ 8 mm, ♀ 8 mm; wing length, ♂ 6 mm, ♀ 6 mm.

Holotype. ♂, **China,** Inner Mongolia, Alxa, Bantan well, 09-V-2019, Aiping LIU. **Paratypes.** 4♂5♀, same as holotype.

This new species is most similar to *Eumerus tuberculatus* (Rondani, 1857)，but differs from the latter by mesonotum without whitish pollinose middle stripes, tergite 4 with distinctly L-shaped whitish pollinose bands, eyes with long and dense hairs in male but less distinct in female, hypandrium ventrally with a semicircular sheet protruding on the middle of lateral margins.

Etymology. The specific epithet is derived from locality where the type specimens were collected.



Figures 1–15. *Eumerus alxaensis* Huo & Liu **sp. nov.** 1. Male head, lateral view; 2. Male head, anterior view; 3. Male scutellum and abdomen, dorsal view; 4. Wing; 5. Male antenna; 6. Male abdomen terminal, ventral view; 7. Male hind leg, anterior view; 8. Male terminalia, side; 9. Male tergite 9 and appendages, ventral view; 10. Male tergite 9 and appendages, posterior view; 11. Male tergite 9 and appendages, lateral view; 12. Aedeagus; 13. Female scutellum and abdomen, dorsal view; 14. Female antenna; 15. Female head, anterior view.

2. ***Eumerus seximaculatum* Huo & Liu sp. nov.** (Figs 16–29)

Male. Head nearly hemispherical, broader than thorax. Compound eyes bare, eye juncture slightly shorter than 1/2 length of frons. Occiput broad, laterally narrowed downward, black, covered with silver-white pollinosity and dense whitish hairs. Vertex black, thinly with silver-white pollinosity and yellowish-white long hairs. Ocellus triangle isosceles, without pollinosity, located on middle part of vertex triangle anteriorly. Frons small, covered with densely silver-white pollinosity, concealing the background, with whitish long hairs. Lunule narrow, shining black. Face relatively flat and slightly retracted in lateral view, expanded gradually downwards on sides in anterior view; face covered with densely silver-white pollinosity, concealing the background, with whitish long hairs. Genae narrow, with silver whitish pollinosity and yellowish white hairs. Antennal sockets confluent. Antennae yellowish-brown, basal two segments of antennae dark brown to black brown, scape very short, obviously shorter than pedicel, basal two segments of antennae dorsally with yellow setae, flagellomere nearly quadrilateral, longer than high, anterior margin obliquely downward, combined with dorsal margin obtuse, ventral margin acute, arista of three segments located near the middle of scape dorsally, thicker basally, bare, black.

Thorax. Mesonotum longer than broad, bright black, with fine punctations and yellowish long hairs, silver-white longitudinal stripes medially extend to behind transverse suture, a row of black short bristles on lateral margins above the base of wings. Scutellum shining black, broader than long, marginated, with fine punctations and yellowish long hairs, subscutellar fringe absent. Pleuron dull black, with metallic luster, decorated with yellowish hairs, bare on anterior anepisternum ventrally, the middle and posterior part of anepimeron and katepimeron, upper and lower posterior hair patches of katepisternum broadly separated. Metasternum black, with pale yellow hairs.

Leg. Front leg black, yellowish-brown on apical and basal part of coxa, trochanter, femur, tibiae and tarsi tawny, dark brown on the basal half of tibiae, covered with yellowish white hairs; Middle leg approximate to front leg, black spots on apical half of tibiae obvious; hind femur distinctly thickened, anterior and posterior with black bristles on ventral apical, longer on posterior, exceed middle of femur; basal 1/3 of tibia slender, with median carina ventrally scattered with black bristles, apical 2/3 of tibiae thickened; hind legs black, yellowish brown on apical margins of femur, base of tibiae and tarsi, middle of tarsi bright black basally. Hind leg covered with white hairs, longer on anterior femur, yellow hair bands on tibiae and tarsi.

Wing. Bare basally, microtrichia on marginate portion. Vein r-m oblique, combined with vein M_{1+2} at middle of cell dm posteriorly. Vein R_{4+5} slightly dips into r_{4+5} cell. Vein M_1 bulged outwards, rounded on near apical end and then recurrent apically, crossed with vein R_{4+5} in obtuse angle. The end of vein dm-cu far from wing margin. Stigma pale yellow. Calypters yellowish-white, halters tawny.

Abdomen. Longer than head and thorax together, basal part slight narrower than width of thorax, tergites black except posterior portion of tergite 4 dark brown, with tiny punctations and metallic luster; tergites covered with whitish short hairs; tergites 2 to 4 each with a pair of nearly oblique white pollinose fasciae at middle portion, white pollinose markings inversely V-shaped, with the apical end separated, with inner end approaching more to anterior margin than outer ends; Sternites black to dark brown, with yellowish white hairs. Posterior margin of sternite 4 concave shallowly and circularly. Male terminalia yellowish brown with white hairs.

Male terminalia. Yellowish brown. Epandrium higher than long, dorsal margin shorter than ventral margin, posteroventral corner protruded. Cerci narrowly striped in lateral view, slightly enlarged terminally, covered with yellow hairs on outer surface. Surstyli structures complex, posterior 1/3 of surstylus a narrow stripe approximately, beak-shaped apically, outer surface 2/3 with tubercles laterally, tuberculate and surrounded with yellow hairs; subjacent of surstylus nearly truncate, tridentate structure protruding from inside; surstylus with light long hairs along interior. Hypandrium yellow, inflated basally, apical half diminished obviously, with black sheet structure on superior lobe apically. Aedeagus slender, acute apically, aedeagus apodeme slender, Ejaculatory duct narrow, fan-shaped posteriorly.

Female. Compound eyes bare. Vertex on posterior margin of eyes broad, occupying about

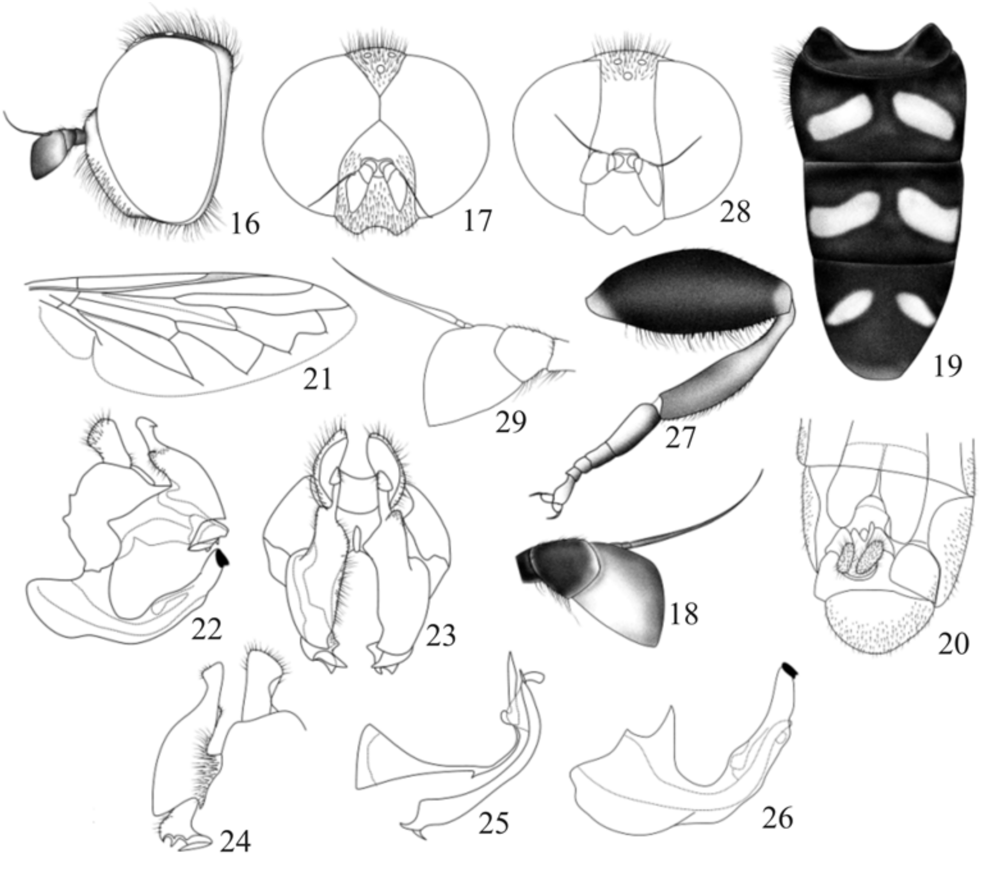
1/6 of the head width, vertex and frons almost parallel laterally. Antennae yellowish brown, and anterior margin of flagellomere blackish brown, cross ventral margin making acute angle. Posterior margins of tergite 4 straight.

Body length, ♂ 7 mm, ♀ 7 mm; wing length, ♂ 5 mm, ♀ 5 mm.

Holotype. ♂, **China,** Inner Mongolia, Alxa, Bantan well, 09-V-2019, Aiping LIU. **Paratypes.** 4♂5♀, same as holotype.

This new species is more similar to Eumerus strigatus (Fallén, 1817), but this new species with bare compound eyes, vertex covered with pale yellow hairs, sternite 4 with posterior margin concaved deeply.

Etymology. The specific epithet is derived from the abdomen having six spots.



Figures 16–29. *Eumerus seximaculatum* Huo & Liu **sp. nov.** 16. Male head, lateral view; 17. Male head, anterior view; 18. Male antenna inside; 19. Male abdomen, dorsal view; 20. Male abdomen terminal, ventral view; 21. Wing; 22. Male terminalia, side; 23. Tergite 9 and appendages, ventral view; 24. Male tergite 9, inside; 25. Aedeagus; 26. Male tergite 9 and appendages, lateral view; 27. Male hind leg, anterior view; 28. Female head, anterior view; 29. Female antenna, inside.

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